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THE MARKET FOR U.S. SOYBEANS AND SOYBEAN MEAL IN EASTERN EUROPE

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FOREWORD

The countries of Eastern Europe all have important livestock industries and have been developing their poultry operations. Producers in these countries recognize that use of feeds containing soybean meal adds to the efficiency and productivity of their operations. Because soybean production in Eastern Europe as a whole is quite small, they have been turning increasingly to quality toasted soybean meal imported from the United States or have been crushing meal from imported U.S. soybeans.

Quality U.S. soybeans and meal have been priced competitively and are finding a steady, firm market in this area because they produce efficient results. To some extent, U.S. soybean meal competes with imported fishmeal. However, these two meals are being looked upon increasingly as complementary products rather than competitors, and together they are contributing to record production levels and quality meat products. Furthermore, the U.S. crushing industry has been able to supply Eastern Europe with large quantities of soybean meal as needed, proving itself a reliable source. It has developed a substantial cash market for its product through personal service and technical assistance.

Continued attention to the East European market will be necessary to meet the growing competition for this area's soybean and meal imports and to meet the specific technical requirements of its maturing feed industries.

This publication aims to provide the U.S. oilseed and oilseed-product industries with useful information on the past and potential development of the East European market and its livestock and oilseed-crushing industries. The publication was developed following the author's interviews with key government and industry personnel and his inspection of crushing and feed operations in the countries covered. Comments on any of the statements made herein will be welcome.

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The Market for U.S. Soybeans and Soybean Meal in Eastern Europe

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INTRODUCTION

The Eastern European countries covered herein include Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and Yugoslavia. Soybeans and soybean products are among the small number of U.S. agricultural products that are now moving to these countries under developing dollar trade terms. This is because soybean meal has become a highly desired ingredient in the feeds used in their expanding poultry, hog, and other livestock industries. The acknowledged high quality of U.S. soybean meal and the excellent results achieved with it point to the enlargement of the East European market simultaneously with the further development of these industries. If present trade conditions prevail, these countries could more than double their current imports of U.S. soybeans and products in the next 5 years.

Trade barriers are not a problem in this trade because the government import monopolies in East Europe are quite anxious to buy U.S. soybean meal and soybeans. While import licenses are necessary in most of these countries, the government monopolies secure their own licenses. The necessary foreign exchange also is provided for because the imports are made in accordance with government plans. Nevertheless, availability of foreign exchange, which is limited and controlled, is often a problem, particularly this year in Czechoslovakia.

To Eastern Europe's growing soybean and soybean meal market (excluding East Germany) the United States shipped the equivalent of 476,000 metric tons of meal and beans, in terms of soybeans, in 1969; this was four times the average amount shipped in the 1960-64 period. Actual shipments were 302,009 metric tons of meal and 78,731 tons of beans; in terms of meal, the total was 380,735 tons. During the 1960-64 period, an average of 103,158 metric tons of meal and beans were shipped, in terms of soybeans, or 50,750 tons of meal and 35,886 tons of beans. In terms of meal the total was 78,913 tons.

Yugoslavia has been the United States' largest East European market for soybean products. However, Poland is catching up on meal imports, while both these countries have ceased large imports of soybean oil. Poland was the United States only soybean oil market in this area in 1968, primarily because large sunflowerseed crops were being crushed in the southern countries of Eastern Europe.

U.S. exports of soybean meal to Yugoslavia have tripled since the early 1960's and totaled 135,010 metric tons in calendar year 1969. Record shipments of 144,128 tons were made in 1967. These volumes compare with 35,723 tons in the 1960-64 period. In the 1968-69 marketing year (September-August) the amount reached 122,380 tons.

Exports of U.S. soybean meal to Poland have multiplied three times since 1965 and more since the 1960-64 period. This country took 91,329 tons in 1968, compared with 30,276 in 1965 and an average of 2,580 tons in 1960-64. The 1968-69 marketing year (September-August) total reached 93,441 tons.

Bulgaria and Hungary also have become strong markets for soybean meal, taking 29,698 and 39,493 tons, respectively, in 1969. Czechoslovakia, a new market, took 12,500 tons. Romania recently purchased its first shipload of U.S. soybean meal and should become a bigger market as a modern poultry industry develops there.

In addition to U.S. soybean meal, the East European countries have been importing large quantities of Peruvian fishmeal and Indian peanut meal. Shipments of fishmeal in January-July 1969 reached 188,221 tons. During 1968 and 1967, fishmeal imports totaled 280,109 and 257,785 tons, respectively, and imports of peanut meal were 499,736 and 351,988 tons.

Exports of U.S. soybean oil to the East European countries generally have been declining. This is because the area has increased its own production of oilseed crops—sunflowerseed in the south and rapeseed in the north—and several countries have been developing modern oilseed crushing industries (continuous prepress solvent extraction for high-oil-content seeds). On the other hand, current developments indicate a possible increase in the crushing of soybeans, which would help to maintain soybean oil use. U.S. soybean oil sales to Poland and Yugoslavia were

particularly heavy at one time under P.L. 480 programs but have declined sharply as domestic production and crushing of oilseeds have increased in recent years. Current credit programs are maintaining some sales of soybean oil to Poland.

Soybean meal, however, has been accepted as one of the few necessary agricultural commodities that should be imported because it is now considered essential to the successful development of modern poultry and, to a lesser extent, hog industries. It cannot be duplicated by domestic meal—sunflower and rape for the most part.

East Europe's hog industry is only slowly getting back on its feet after extra-heavy slaughter because of drought and foot-and-mouth disease in several countries in 1968. For example, permanent hog herds in January 1969 were more than 19 and 13 percent less, respectively, in Hungary and Yugoslavia compared with the January 1968 level. In January 1970 total hog numbers were still 13 percent below the 1968 level in these two hardest hit countries.

However, during 1969 an excellent corn crop was harvested in East Europe and soybean meal use for feed continued. Excellent grades of pork were produced, and both export markets and domestic consumption increased. In addition, modern poultry industries are now established and should greatly add to imports of soybeans and soybean meal as soybeans cannot be successfully grown in East Europe.

The development of modern feeding programs for the new poultry (broiler and layer) industries and revitalization of the traditional hog industries has led to the growing demand for quality 44-percent protein soybean meal from the United States.

By using soybean meal and added vitamins and minerals in formulas recommended by U.S. scientists, to attain high production standards poultry raisers in Eastern Europe have achieved excellent feed-conversion rates ranging from 2.1 to 2.5 (1 lb. or 1 kg. of meat obtained from 2.1 to 2.5 lb. or kg. of properly balanced feed). Most of the poultry rations now used contain from 10 to 30 percent soybean meal, depending upon the type of poultry being fed and the availability of soybean meal. Conversion rates in the hog industries have reached 3.5 to 1 with feeds containing as much as 10 to 20 percent soybean meal. Livestock raisers are looking forward to the time when the availability of soybean meal will increase so that they will be able to correctly formulate all poultry and hog rations according to recommendations of U.S. feed mixers and soybean crushers.

Only minor complaints have been received regarding U.S. soybean meal and soybeans, and these were not about the general quality. One complaint that has been received in port areas is that U.S. soybean meal at times is very lumpy and requires regrinding. A second complaint concerns a higher percentage of weight loss than is generally allowable. Some complaints received on U.S. soybeans deal with an increase in the percentage of splits. This condition results from the many transfers that are required to deliver the beans to inland mills. There are no oilseed crushing mills located on deep water in either Poland or Yugoslavia at the present time. Several complaints were received on U.S. merchandising practices for both beans and meal. These mainly concerned weights and certification procedures.

But from all countries reports have been received that the services of U.S. firms have been greatly appreciated. U.S. soybean crushers and international grain traders have apparently done an excellent job in helping to develop the U.S. soybean meal and soybean markets in Eastern Europe. Many have provided information and recommendations on the most efficient soybean meal rations and formulations under East European conditions—such as different availabilities of feedgrains and other supplements and concentrates. These services have developed and established excellent contacts for future sales of U.S. soybean meal.

Credit in U.S. dollars has become a major problem for some of the smaller East European countries (Bulgaria, Czechoslovakia, and Hungary) that have restricted dollar exchange as a result of their limited trade with the West. However, these countries have expressed a desire to improve their credit relationships with the United States, and some responsible officials have asked for credit extension on the part of the U.S. Government or trade. Should such arrangements come about, U.S. sales of soybean meal can be expected to increase.

THE MARKET

The countries of Eastern Europe—specifically Bulgaria, Czechoslovakia, East Germany, Hungary, Romania, Poland, and Yugoslavia—are a growing market for U.S. soybeans and soybean meal as they strive to provide their 125 million people with more meats—especially poultry meat and ham—and to develop export markets for these products. With a growing per capita gross national product averaging the equivalent of over $1,280 (excluding Yugoslavia) and a present poultry consumption of around 8 to 11 pounds per capita, against 39 pounds in the United States, this area offers considerable potential for further sales. Yugoslavia, at the bottom of the area's economic ladder with a per capita GNP of $750, is expanding its economy, and incomes there no doubt will eventually reach levels closer to those of its neighbors.

Specific levels of poultry consumption per capita include 10.6 pounds in Yugoslavia, 8.1 pounds in Poland, and 8.0 pounds in Bulgaria. Hungarian consumption of poultry was reported in 1968 at 26 pounds per capita compared with around 10 pounds previously reported.

Poultry meat production a strong indication of the growing soybean meal demand in the East European countries increased over one-third during the 1964-68 period as a result of the rapid development of the broiler industry. In 1968 total production was over 700,000 tons, more than production in both West Germany and France. The recently created market for soybean meal more than doubled in this same period. Poultry meat production was up 6 percent in 1969 over 1968. Poultry numbers at the beginning of 1969 were nearly 2 percent above 1968 and totaled around 300 million, increasing in every country except Hungary. There, slaughter in 1968 was particularly heavy because of drought, reduced feed supplies, and large demand.

Poultry technicians and other government officials point out that total demand for soybean meal in the poultry industry can be expected to continue to climb as the industry surges forward.

Demand for soybean meal was affected by a 2.6-percent drop in East Europe's hog population from around 49.4 million in early 1968 to around 48.1 million in early 1969, largely as a result of the 1968 drought. The decline was 19.3 percent in Hungary and 5.1 percent in Czechoslovakia. Because of increased incidence of foot-and-mouth disease and drought in Yugoslavia, the hog population there declined 13.1 percent to 5.1 million. But in Bulgaria, East Germany, Poland, and Romania hog numbers showed some increase. Based on a hog population of 50 million, the demand for sunflowerseed meal, rapeseed meal, soybean meal, and other proteins could be around 1.7 million tons, of which as much as 400,000 tons could be soybean meal. Both Yugoslavia and Hungary are again building up their hog numbers, and consumption of mixed feeds is expected to reverse the downward trend in 1969.

Cattle numbers followed about the same downward trends as did hogs. Increasing quantities of soybean meal are being utilized in beef cattle feed in the East European countries as the development of the beef and veal industries continues. However, cattle, of which there are about 34 million head in Eastern Europe, do not offer a potentially large market for soybean meal. Neither do sheep, of which there are about 40 million. Domestically produced sunflower meal and imported peanut meal are used extensively in the cattle industry.

Altogether, soybean meal consumption in these countries could well reach over 1 million tons to meet the demands of the growing poultry and hog industries. If the most efficient rate of soybean meal were used in feeds for these industries at the present time, around 600,000 tons would be used for poultry and 400,000 tons for hogs. This indicates a potential market for at least 500,000 tons more of U.S. soybean meal or soybean equivalent. If Eastern Europe's hog and poultry meat sales abroad are increased substantially through the 1970's, still more soybean meal imports will be needed.

U.S. soybean meal and soybeans are purchased in all of the East European countries by government monopolies or state trading organizations empowered to import specific commodities. Currently, the monopolies importing soybeans and soybean meal in each country are: Bulgaria, HRANEXPORT and RODOPA; Czechoslovakia, KOOSPOL; Hungary, AGRIMPEX; Poland, ROLIMPEX; Yugoslavia, CENTROPROM.

Many of these organizations buy soybean meal and soybeans through West European offices of U.S. firms. Most of these firms are in constant contact with their buyers, and some business is done on a person-to-person basis. Business in several countries is done on a letter-of-credit basis, which, although useful, has become very difficult for importers, whose funds are often tied up for nearly a month before the commodities are received. Several buyers have indicated a need for additional credit. Credit could be useful in Bulgaria, Hungary, and possibly in Yugoslavia. Some Polish buyers reported that they generally do not need credit, and Czechoslovakian buyers report that they could not use it as imports are under tight control. Many buyers in the East European countries expressed considerable thanks for the servicing of sales that they were receiving from U.S. firms. They were also appreciative of the fact that they could buy in large-lot (cargo size) shipments and that current prices were constantly made available to them by these firms.

THE OILSEED CRUSHING INDUSTRY

Technical development of the oilseed crushing industry is underway, and the present annual crushing capacity of six countries (Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia) of around 2.5 million tons can be expected to increase both in efficiency and in total. Many crushing mills in the East European countries have modern continuous-solvent extraction equipment, and many more are reported to be under reconstruction. For the most part, this equipment is operated in combination with screw-press equipment to process high-oil content seeds and other materials—mainly sunflower with 50 percent oil, rapeseed with 45 percent oil, and imported copra with 63

percent oil. Nevertheless, many modern crushing mills with solvent extraction equipment in Poland, Czechoslovakia, and Hungary have the necessary equipment, such as flaking rolls, to crush soybeans when they are available.

Most of the countries have consolidated their oilseed crushing operations to eliminate many of the older, inefficient mills. As a result, much of the oilseed crushing now is done in large mills with continuous-solvent and screw presses that are integrated with modern refining and processing operations. Most of the larger mills crush from 220 to 300 tons of oilseeds per day. Modernization of crushing, refining, and hydrogenating operations continues to progress. Margarine plants, for the most part, also have been modernized with modern "votator" (internal chilling and emulsifying) equipment.

The oilseed crushing industry usually is operated through a government-sponsored organization under the Ministry of Agriculture and/or Food.

Crushing capacities in the six countries currently are as follows:

Country	Number of mills	Crushing capacity[1]
		Metric tons
Romania	6 large	700,000
Bulgaria	2 large plus 20 small	400,000
Czechoslovakia	4 large	250,000
Hungary	5 large	250,000
Poland	7 large	500,000
Yugoslavia	6 large plus 10 small	400,000
Total	30 large plus 30 small	2,500,000

[1] Estimated basis 300 days operation as reported by industry officials and only partly confirmed by observation.

An example of industry modernization is the new extraction plant at the oil mill in Kruszwica, Poland, where a new 300-ton De Smet continuous-solvent extractor was added to existing facilities in 1962. Subsequently, new continuous refinery equipment, modern deodorizers, and hydrogenation equipment were added. Modern "votators" also were installed in the mill's margarine plant.

The Yugoslav Government is considering the possibility of obtaining an American firm to enter into a joint enterprise agreement with the Port of Authority of Koper to provide 49 percent of the funds to construct and operate a modern solvent-extraction soybean crushing mill at the port, which is now being developed at an excellent location on the Adriatic Sea near Trieste. The plant would be located in a new, large grain complex and would utilize modern silo facilities being built and the present soybean-oil bulk-storage capacity of about 23,000 tons.

The proposed plant would be capable of crushing around 200,000-300,000 tons (7 million-11 million bushels) of soybeans annually, which would be imported from the United States. The plant would supply soybean meal to several of European countries and soybean oil to Yugoslavia and to other markets in the area. Obviously, if this plant is built, it would cut into the United States cash meal market in this area, but in turn it would provide a consistent cash soybean market.

DOMESTIC OILSEED SUPPLIES

Harvests of the major oilseeds produced in Eastern Europe, sunflowerseed and rapeseed, have increased substantially over the past 10 years. Other edible and industrial oilseeds produced are mainly flaxseed, soybeans, cottonseed, or cast poppyseed, and sesame.

Yugoslavia has for many years planned to increase its soybean production but because of climatic conditions and other factors has not been able to find any profitable varieties adaptable to the local growing season and conditions. Production averaged 8,981 tons during the 1962-66 period and remained at 8,872, 8,791, and 8,845 tons in 1967, 1968, and 1969, respectively. Yields here reached 20.3 bushels per acre. In 1967 Romania produced a record 41,400 tons of soybeans on 121,300 acres. In 1968 and 1969 acreage rose to 148,000 acres, and production was reported at 40,008 and 47,410 tons, respectively, but yields were below 1967 levels because of a drought in 1968 and a slight drought in 1969; they totaled 12.5 bushels per acre in 1967 and 9.9 in 1968. Other countries, including Bulgaria and Hungary, grow soybeans as minor crops, but yields also have been low and discouraging.

Small crops of flaxseed and castor beans are produced for industrial oil. Flaxseed is produced mainly in Poland, Romania, Hungary, Czechoslovakia, and East Germany, while castor beans are produced largely in Romania. Flaxseed production has leveled off in recent years. Limited amounts of cottonseed are available for crushing in Bulgaria and Yugoslavia.

The sunflowerseed crop is the major oilseed crop grown in Eastern Europe. Production of this crop has expanded greatly in Romania, Yugoslavia, and Bulgaria but has declined in Czechoslovakia and Hungary over the past decade. Production rose about one-half in Bulgaria, 41 percent in Romania, and triple in Yugoslavia from 1960 to 1969. Total production was expected to reach around 1,762,000 metric tons in 1969, two-thirds more than the 1,037,000 tons grown 10 years earlier. However, acreage increased only around one-eighth from 2.3 million acres to 2.6 million. Yields were up around one-third from around 1,100 pounds per acre for 1960-64 to 1,455 pounds, and average oil contents of seed rose from around 37 percent to about 45 percent and for some varieties to nearly 50 percent in several countries. Average oil yield (recovery) in a few countries increased and have reached over 40 percent as several new varieties of sunflowerseed from the Soviet Union were adapted to local growing conditions. All producing countries are actively working on this problem. For the most part, the meal content of the new sunflowerseed varieties was reduced less than the hull content. As the oil content rose, the hull content of the seed was reduced from 20 percent to around 10 percent or less of the total composition of the seed, but meal content remained at near 40 percent.

Rapeseed production also rose in East Germany and Czechoslovakia and nearly tripled in Poland during the years 1964-65/1967-68. Total rapeseed production in Poland, East Germany, Czechoslovakia, and other areas in 1967-68 was three-fourths greater than the 1962-66 average.

Both sunflowerseed and rapeseed are heavily traded in the East European countries. Hungary imported 12,920 metric tons of sunflowerseed in fiscal year 1968 and 17,046 tons in 1967; this country also exported 18,216 and 13,990 tons in the same years. Yugoslavia's imports totaled 22,843 tons of seeds in 1968, but exports were 14,318 and 7,268 tons in fiscal years 1968 and 1967. Bulgaria and Romania also were large exporters of sunflowerseed. Poland exported over 160,000 tons of rapeseed in 1967-68 and 89,000 tons in 1966-67, mainly to Western Europe.

Diseases of the oilseed crops, particularly sunflowerseed, are many, and research stations are actively testing and studying disease-resistant varieties. Programs are often concerned with maintaining and developing varieties with a high oil content and yield and at the same time establishing disease resistance in these varieties.

MEAL IMPORTS

The East European countries have long been importers of oilseeds and meal as a source of proteins for livestock and poultry. In 1967 and 1968 imports, including fishmeal, averaged over 1.6 million tons of meal, more than half (53-55 percent) of total available supplies. Besides soybeans and soybean meal, large amounts of fishmeal from Peru and northern Europe have supplemented the low domestic supplies of proteins. Large quantities of peanut, cottonseed, and other meals also are being imported from India and Africa. In addition, Eastern Europe has substantial quantities of domestic sunflowerseed meal in the south and rapeseed and linseed meals in the north. Some cottonseed meal is available locally in Bulgaria and Yugoslavia, the only cotton-producing countries in Eastern Europe, and cottonseed protein supplies are also imported from the USSR.

Appendix table 1 shows soybean and soybean meal exports from the United States to Eastern Europe. Table 3 shows total consignments by country of soybean meal and soybeans as meal at around 636,283 tons in 1968 and 644,000 tons in 1967, over 20 percent of total available protein meal supplies and around 40 percent of meal imports. East Germany was the largest importer of oilseed meals, mainly soybean meal, but Yugoslavia, Czechoslovakia, and Hungary also obtained the largest portion of their supplies abroad. Most of the soybean meal imported by East Germany comes from the German Hamburg and Rhine crushing mills or is transferred from incoming shipments and moved up the Elbe River as both beans and meal.

Indications are that total protein supplies available in the East European countries totaled nearly 3 million tons in 1968. Insufficient data are available to develop reliable meal and protein supply/distribution tables for this area so that in compiling table 3, total supplies available were estimated from the major crops plus consignments.

USE OF SOYBEAN MEAL IN THE MIXED FEED INDUSTRY

Corn production has been expanding in several of the southern countries of Eastern Europe, and livestock and poultry industries have been increasing throughout the area. This has resulted in the growth of mixed feed industries to supply the necessary balanced rations. Modern knowledge of ration compounding and feeding practices are wide spread. With the development of a modern mixed-feed industry, Eastern Europe is emerging as a permanent market for proteins, particularly for soybean meal, which has been established as an essential ingredient in balanced formulas for both poultry and hogs.

Many mixed-feed mills have been built in recent years for the purpose of supplying balanced mixed feeds to the many large state and cooperative farms, as well as private farms where poultry and hog operations have been

expanded. The mixed-feed industries have been continually expanding their capacities and modernizing their operations. In five countries production, which is near capacity, has risen to around 10 million tons in recent years, providing nearly all of the feed used in the poultry industries, large quantities for hogs and cattle, and some for sheep and horses. Mixed formula feeds for poultry have become the major feed used on most commercial farms and particularly on state and cooperative farms. Mixed-feed capacity in 1969 in five countries has been reported as follows:

Country	Number of plants	Mixed feed produced capacity
		Metric tons
Bulgaria	18 large, 12 small (30 total)	1,000,000
Czechoslovakia	300 small	2,000,000
Hungary	200 small	1,000,000
Poland	30 large, 270 small (300 total)	3,500,000
Yugoslavia	13 large, 60 small (173 total)	3,000,000
Total		10,500,000

The above tabulation was compiled from official government reports, industry interviews and personal visitations. In some countries capacity and production appear to be synonomous.

At an average rate of soybean protein use of 10 percent in the mixed-feed industries, the East European countries eventually will be using 1 million tons of soybean meal. Current use is around one-half of this potential, indicating that future expansion of soybean meal use in mixed feeds at double the present rate is almost a certainty. Therefore, it can be expected that, under present price relationships, the use of soybean meal either from domestically crushed beans or imported directly as meal, will probably double in a few years.

The modern feed formulas used are based on soybean meal, fishmeal, and corn. In Yugoslavia, Bulgaria, and Hungary soybean meal, if available, is used by the large feed mills in feed formulas in about the same proportions as in the United States (12-30 percent). Fishmeal is being recognized more and more as a supplement to soybean meal; a 5-8 percent limit generally is set on its use. Because of their availability, peanut and sunflower meals are sometimes substituted for part of the soybean meal in the formulas, which decreases their efficiency, as synthetic essential amino acids usually are not available.

In Poland excellent results are obtained with broiler starter feeds using 25 percent soybean meal and 8-10 percent fishmeal and broiler finishing feeds using 13 percent soybean meal and 4 percent fishmeal. Use of fishmeal is limited to a maximum of 10 percent in broiler feeds because its use in larger amounts taints the meat with a fishy flavor. Hog feeds with 9-15 percent soybean meal and 6 percent fishmeal have proved excellent. However, extensive onfarm feeding of potatoes to hogs (as high as 30 million tons are reportedly used for feed) has limited use of mixed feeds in this industry.

Bulgaria plans to increase its poultry meat production in the next 2 years from the current level of 60,000 tons to around 100,000 and hopes to continue to use soybean meal in about the same proportions used in the United States.

In Yugoslavia, where the poultry and hog industries are largely on state farms, the use of soybean meal is considered essential in the mixed feed industry that supplies nearly 100 percent of the poultry feeds. (Many of these feeds are pelleted for greater efficiency.) Hence, soybean meal is used at a rate of from 8 to 25 percent in poultry feeds (starter chick feeds, 15-20 percent; layers, 8-15 percent; broilers, 16-25 percent; and broiler finisher, 10-15 percent). If fishmeal is not available for 5 percent of the rations, then more soybean meal is used. In hog feeds 20 percent soybean meal is used in starter rations and 10-15 percent in grower feeds. In hog finisher rations, 20-30 percent soybean meal is used. Sunflower and peanut meals are also used extensively in hog feeds.

In Hungary most of the mixed feed is used in the poultry (35 percent) and hog (50 percent) industries. All of these feeds contain soybean meal in about the same proportions as in Yugoslavia. The maximum percentage of soybean meal (5-25 percent) is used in poultry and hog feeds, depending on type, with an average of 5 percent fishmeal.

Results obtained with soybean meal in the poultry industries have been possible partly through importation of improved modern breeds and hybrid strains of poultry, both broilers and layers, from the United States.

PRODUCTION AND USE OF FATS AND OILS

Production of sunflowerseed and rapeseed has been increasing in Eastern Europe. In addition to increased supplies at home, some sunflowerseed is being imported from the USSR. At the same time, the crushing and refining industries have been expanding, providing more oils and meals. The increased production of vegetable oils has caused consumption in these countries to increase at the expense of animal fats. Continued expansion in production of sunflowerseed and rapeseed meals will no doubt require use of more soybean meal for production of balanced rations because these meals are deficient in some essential amino acids that are provided by soybean meal. For example sunflowerseed meal is deficient in lysine.

Production of linseed oil and castor bean oil is supplemented by importation of these and other industrial oils.

Production of butter and margarine generally is increasing although in some countries output is leveling off or declining.

Total consumption of fats and oils is particularly low in Yugoslavia, Poland, and Bulgaria, where it is about half that in East Germany and Czechoslovakia. However, Yugoslavia and Poland have made progress in increasing consumption of vegetable oils since 1960, which was 12 and 16 pounds per capita in 1967, respectively. Increases probably have taken place in most of the other countries, too, but data for 1969 on consumption are lacking and a clear picture is not available.

Soybeans fit well into the demands of the East European countries, which are still low in overall protein supplies. The trend toward consumption of vegetable oils and stabilized animal fats appears to be taking place in every country except Hungary, where consumption of lard and slaughter fats is particularly high, three times that in the other countries. The other countries appear to be leveling off in animal fat consumption, but during 1968-69 consumption no doubt increased with the rise in livestock slaughter.

COUNTRY PROFILE: YUGOSLAVIA

Summary

Yugoslavia was formed in 1946 as a Socialist Federal Republic comprising six socialist republics and two autonomous states. This country is a member of GATT and has special status with OECD. It is the most liberal of the Eastern European countries in its dealings with the West.

The population is around 20 million, and the country has a labor force of about 9.1 million, of which over 50 percent is in agriculture. Its per capita gross national product (1967) of $750 is one of the lowest in Eastern Europe. However, the GNP grew 6.5 percent in 1968 to $9.9 billion and was increasing at a faster rate in 1969, providing for larger per capita incomes and increased consumer expenditures for foods, including fats and oils.

Yugoslavia is a growing market for U.S. soybean meal, and this country could probably use an additional 50,000 to 100,000 tons if present livestock and poultry development plans materialize. Estimated import needs for 1970 are 152,000 metric tons all on convertible dollar accounts.

Should Yugoslavia obtain a U.S. partner to provide 49 percent of the investment, as provided for by new liberalized investment laws, and build a new soybean crushing plant at the free port of Koper, the country could import 200,000 to 300,000 tons of soybeans each year, mainly from the United States. Current U.S. soybean meal imports would be replaced and possibly some meal would be shipped to other East European countries, but total exports from the United States in terms of both meal and oil would be increased.

The Yugoslavians are highly satisfied with the quality of the U.S. soybean meal they have received. They have minor complaints, but these generally are concerned with weight loss and discharging problems.

The government buying agency, CENTROPROM, reported that it is able to operate very effectively with the U.S. companies that have established offices in Europe. Its officers are pleased with the services they receive from the large U.S. international trading firms and soybean crushers.

Technologists have recognized the advantages of using soybean meal in poultry feed formulations. They use soybean meal in about the same ratios as are used in the United States in poultry and hog feeds. The mixed feed industry has been partially modernized and is still expanding its capacity and developing and modernizing its methods and techniques rapidly to meet requirements for producing the special soybean meal/corn based feeds demanded by modern poultry and hog industries. As a result, a soybean meal market has been permanently established, and Yugoslavia could be taking over 150,000 tons in the next few years and 200,000 tons within 5 years.

Right, a large mixed-feed plant near Zagreb, Yugoslavia; this plant has a production capacity of 100,000 tons per year. Below left, part of Yugoslavia's record 1969 sunflower crop, the country's major oilseed. Below right, a medium-sized mixed-feed plant in Zagreb; trailer delivers bagged feed ingredients to storage area.

Below, soybean oil storage tanks at the Port of Koper on the Adriatic Sea south of Trieste in Yugoslavia. These tanks have a capacity of 23,000 metric tons.

The consumption of fats and oils in Yugoslavia is around 33 pounds per capita, compared with 50 pounds in Italy and 57 pounds in West Germany. This level allows for considerable increase as incomes rise. Increased availability of vegetable oils, both sunflower and possibly soybean, will provide for increases in production and consumption of margarine, cooking oil, and other products.

Sunflowerseed production in 1969 is currently estimated at 390,000 metric tons. Present capacity of the country's crushing industry is around 400,000 metric tons. About 150,000 tons of sunflowerseed oil was produced, making the country self-sufficient in vegetable oil at current consumption levels.

Hog production, which was down in 1969, is expected to return to normal and then increase in coming years, resulting in increased use of soybean and other meals.

Purchasing

The Government of Yugoslavia has granted a monopoly to CENTROPROM to purchase and/or export oilseeds, vegetable oils, and high-protein meals. CENTROPROM is the sole Yugoslavian organization that handles the purchasing of U.S. soybean meal through U.S. exporters. This organization reported that it was buying Indian peanut meal under Yugoslavian trade agreements with India because peanut meal was one of the few commodities that India could offer in exchange for Yugoslavian industrial products.

Soybean meal is purchased in shipload lots of around 15,000 tons. The officials of CENTROPROM have highly praised the services they get from U.S. firms with European offices. Contacts such as these are reported to be most useful in keeping posted daily on prices and market conditions.

While Yugoslavia has a fairly complicated system of imports and strict control over foreign exchange, imports of soybean meal are made by CENTROPROM according to the country's feed requirements; the monopoly works out its own import permits and solves its own problems, if any are involved.

Oilseed crushing capacity

Yugoslavia has 16 major oilseed crushing mills that are primarily engaged in crushing sunflowerseed. About 8-10 smaller plants crush pumpkinseed and rapeseed, and one also crushes cottonseed part time. A new mill, not yet completed, will crush around 75 tons of soybeans daily. Several mills crush small amounts of soybeans, and one large mill is further diversified to crush corn germs for corn oil.

The annual capacity of the sunflowerseed crushing has been estimated by the trade at 400,000 tons. Some 35,000 tons of sunflowerseed were imported for crushing in 1968, but in 1969-70 supplies will be ample to keep the industry operating at over 80 percent capacity, and no imports are expected. All sunflowerseed oil is required by law to be refined, and only pumpkinseed and olive oils may be used as crude oils. Corn oil is now being produced at a mill in Zrenjanin.

Modern crushing techniques are used to prepress by some mills. Most of the mills use hexane or benzine in batch-type extractors to remove the second phase of the oil. From 15 to 20 percent oil is left in the cake after the first and/or second screw-pressing operation, and the final oil content is 0.5 to 1.5 percent. To process sunflowerseed it is first decorticated or dehulled to remove the hulls, which leaves less than 18 percent fiber in the final meal product. The mills that do not extract the oil leave about 5 to 6 percent of the oil in the meal.

Yugoslavia has two large plants (one at Zagreb and one at Vrbas) that refine and hydrogenate vegetable oils to produce margarine and shortening from sunflower and other vegetable oils. U.S. soybean oil was formerly the major ingredient used. However, margarine and shortening made in recent years have contained 50 percent sunflowerseed oil and the rest has been hydrogenated soybean oil, palm oil, or other fats and oils. Two additional plants are producing margarine.

A screw-press plant with a capacity of 75 tons per day is now under construction to process soybeans for production of soy flour and protein. It will have three French screw presses of 25 ton capacity and a special plant for processing flour and protein. Production is estimated at around 11 tons of soybean oil (at 15 percent) and 35 tons of flour, with the balance 28 to 35 tons of meal, depending upon the moisture content of the meal. Soybeans will be received by both barge and rail. Eventually, isolated proteins will be produced.

Port development and soybean imports

The Yugoslavian plan for the development of the port of Koper provides for an industrial complex that could be an important factor in the development of a market for U.S. soybeans but would cut the soybean meal market in both Yugoslavia and in other countries in Eastern Europe. The new port is now being dredged, and the land filled in for the industrial area could be developed into an industrial complex that could include: (1) A new elevator for more efficient bulk handling of soybeans, feed grains, soybean meals, and other meals on deep water for modern rapid discharge from ships holds directly to storage or to interim transportation as needed. Ships of over 20,000 tons could be handled. (2) Construction in the free port of a modern solvent-extraction soybean crushing plant that would receive soybeans directly from the ships at the dock or from storage. This plant's capacity would be 200,000 to 300,000 tons per annum.

This complex would be the first of its kind in Yugoslavia and Eastern Europe and would be a source of soybean meal and soybean oil for Yugoslavia and for Austria, Hungary, Romania, and possibly Bulgaria. Completion of this complex at Koper would reduce the United States total soybean meal sales in Eastern Europe but possibly increase total meal sales as beans.

Existing facilities that could be used by the complex include a vegetable-oil storage field of eight tanks varying in size from 1,000 to 5,000 cubic meters and totaling 23,500 cubic meters. The port has rail links with the north in all directions and is also connected to the north with modern surfaced roads.

The port now handles large quantities of U.S. soybean meal and Peruvian fish meal, but the equipment, although pneumatic, is of limited capacity. There are three small pneumatic discharging tubes with a capacity of 150 tons per hour and bagging facilities with 4,000 tons flat storage available. Some meal is shipped in bulk to neighboring countries or inland to feed-mixing plants. Most of the meal is bagged in paper sacks. Ships of 15,000 to 19,000 tons can dock. This small deep water terminal would be outdated by the new complex.

Several U.S. companies have shown some interest in the development of this new complex. The Yugoslavian Government, as a means of introducing the most modern soybean crushing technology, would like to see a U.S. concern willing to put up equity interests up to 49 percent participate in the development of this new enterprise with the Koper Port Authority under recently liberalized joint-venture arrangements.

Production of sunflowerseed oil

Sunflowerseed area for 1969 has been estimated at 219,000 hectares (541,149 acres), about 60,000 hectares from the previous year's harvested area. The weather was ideal, and excellent rains coming at the right time produced an excellent commercial crop of 390,000 metric tons. Eighty to 85 percent is expected to come from the Vojvodina area north of Belgrade, where the main increase in production has taken place. Total production in 1968 was estimated at around 309,600 tons.

From the 1969 commercial crop approximately 130,000 to 150,000 tons of sunflowerseed oil will be crushed on the basis of crushing most of the crop and recovery at a rate of 40 percent. Approximately 105,000 to 125,000 tons of oil would be consumed as liquid refined oil and approximately 25,000 tons would be used for margarine, shortening, mayonnaise, and other uses.

Retail prices for fats and oils in Yugoslavia range widely. Margarine prices are 15 cents a half pound, compared with butter at about 45 cents. Refined sunflower oil is sold in bottles at about 18.6 cents per pound (5.15 dinars per liter). Lard prices are equivalent to 25 cents per pound.

Mixed feed industry

The mixed feed industry has in its modern sector a capacity of over 2 million tons and possibly now close to 3 million tons, as reported by the Feed Manufacturers Association in Zagreb. The mixed feed industry is composed of at least one large mill with an annual capacity of 100,000 tons (the machinery was a gift from the United States) and 12 mills of lesser capacity (40,000 to 60,000 tons each annually). There are also around 60 smaller mills operating on large cooperative farms, and many of these mills are expanding their capacities.

As many of the mills expand capacity, the consumption of soybean meal can be expected to increase directly with this expansion. It would be expected that an industry of this size could easily use 150,000 to 300,000 tons or more of soybean meal. One mill operation has been using least-cost techniques, but this operation appeared to be allocating materials more by availability than cost.

Soybean meal is firmly established as an essential ingredient in the formulas of the Yugoslavian mixed feed industry. However, the use of fishmeal, as in the United States, has been increased in recent years, but the limitations on the use of fishmeal are well understood. The law requires 20 percent animal protein in feed in Yugoslavia. Poultry and hog feeds account for the major part of production.

Examples of the use of soybean meal by the feed-mixing industry are shown in the following usual percentages given by feed mills and prescribed by Yugoslavian scientists.

Type of ration:	Soybean meal, usual percentage and range	Fish meal
Poultry (general):	*Percent of total ration*	*Percent of total ration*
1 - 2 weeks	24	5
2 - 10 weeks	15 (15 - 20)	5
10 - 20 weeks	8 (8 - 12)	3
Layers	14 (8 - 15)	7 - 8
Broilers:		
Starter	27 (16 - 27)	8
Finishing	25 (10 - 25)	5
Hogs:		
Up to 110 lb.	10 (10 - 15)	6
110 to 220 lb.	5 (4 - 9)	4
Calves	10 (7 - 12)	5

Efficient use of soybean meal in the poultry industry in Yugoslavia has been made possible by the development of the industry using modern American breeds and hybrid strains of chickens. Some U.S. firms pioneered in this country over 10 years ago. The efficiency of production of these modern broilers and layers is based on soybean meal feeds.

Poultry and hog production

Broiler production is increasing in Yugoslavia, because new breeds have been introduced. Efficiency ratios of 2.2 to 1 to 2.4 to 1 have been achieved, and maximum conversion rates for feed have been reached at levels close to those above. Based on present Yugoslavian prices of the equivalent of around 40 cents per pound for poultry versus 80 cents for veal, broiler production is expected to increase substantially.

Some statistics on poultry and hogs are shown below:

	1966	1967	1968	1969[1]
Poultry numbers (Jan. 15) *Thousands*	31,685	35,153	35,974	37,142
Poultry meat production (annual) *Metric tons*	88,000	95,000	[2] 107,000	[1] 110,000
Hog numbers (Jan. 1) *Thousands*	5,118	5,525	5,865	5,093
Pork production (annual) *Metric tons*	–	309,000	323,000	–

[1] Estimate.
[2] Revised.

COUNTRY PROFILE: POLAND

Summary

Soybean meal is considered an essential and valuable ingredient by feed mixers in Poland. They have found it difficult to replace or to substitute for in poultry and hog feeds at certain levels. Other components are, of course, used for part of the essential protein requirement; for example, fishmeal is used up to 4-5 percent. For broiler or layer feeds, use of a high fixed percentage of soybean meal in all types of these feeds has been prescribed by Polish scientists. Together, soybean meal and fishmeal offer poultry and hog raisers maximum returns.

At the present time both the poultry and the hog industries are of relatively small scale, and future expansion into larger enterprises would promise a growing market for U.S. beans and meal. Poland appears to offer an additional potential market for 10,000 to 15,000 tons of U.S. soybean meal or soybean equivalent each year.

Because Poland's present oilseed crops are dominated by rapeseed that can be used only in some feed combinations with soybean meal, the soybean meal market here appears to be a permanent one. Price factors are important in obtaining soybeans and soybean meal, and, as a result, part of this market, particularly for meal, could be lost to European meal suppliers if U.S. prices fall out of line.

Oilseeds, fats, and oils

Rapeseed is the most important oilseed crop grown in Poland. The winter rapeseed crop for 1968 (spring of 1968) was around 712,000 metric tons. Owing to the bad winter of 1968-69, the following crop was expected to be down 35 percent to around 450,000 tons. Some estimates have placed the crop as low as 205,000 tons. But the 1969-1970 crop is expected to be brought back up to above 600,000 tons on about the same acreage as in 1968. The main variety of rapeseed, KZEPAK, contains 46-47 percent oil (dry basis) and is very suitable to Polish climatic conditions. This is a winter rapeseed and is the main variety grown because the spring varieties have a lower oil content. It is sown in August and later harvested in June and July, requiring a 230-day growing season. Rapeseed is harvested by special combines designed to handle this crop.

Rapeseed research is being directed toward finding a low erucic acid variety, and research is also being done on the nutritive aspects of rapeseed meal as livestock feed. Some rapeseed meal is still used for fertilizer (5 percent).

There are no standards for rapeseed, but the seed seldom reaches the mill with more than 0.5-0.7 percent admixture or foreign material. All rapeseed is purchased from farm organizations at a fixed price. It contains less than 1 percent foreign material. The 1969 crop was not of top quality, but was very irregular owing to effect of the hard winter.

The soybean has not been given much attention in research as it has in the countries farther to the south.

Lard is the most important edible fat used in Poland, but consumption of both vegetable oils and butter is increasing at the expense of slaughter fats. Since 1950 margarine, first introduced by the Germans during the war, has become important for cooking, but butter is still the major spread used on bread. Sunflower oil is not being promoted in margarine in Poland, but it is being used along with rape, soybean, coconut, palm, and other vegetable oils. Most of the U.S. soybean oil imported is used in margarine. Very little, if any, animal fat is used in this product.

Consumption of vegetable oil is growing slowly in Poland, and there is not much preference on the part of Polish housewives for specific vegetable oils. Production of margarine increased substantially each year after the war; but since 1964, production has decreased from 146,800 tons that year to 139,000 in 1968, and per capita consumption has declined from 10.4 pounds to 9.6 pounds. On the other hand, both production and per capita consumption of butter have increased substantially during this period. Butter production rose from 87,200 metric tons in 1964 to 123,800 in 1968, per capita availability rose from 6.2 pounds to 8.5 pounds, and consumption rose from 4.6 pounds to about 6.9 pounds.

Oilseed crushing industry

Poland has seven modern oilseed mills, all of which have integrated modern solvent-extraction operations for crushing, refining, and further processing. Several include the manufacture of margarine. All are operated under government direction.

The crushing industry is capable of crushing over 500,000 tons of oilseeds annually, on a rapeseed basis. Besides domestic rapeseed, the industry crushes linseed, sunflowerseed, hempseed, and soybeans imported from the United States (30,000 to 50,000 tons).

Consolidation of the industry into a small number of large, modern prepressing solvent-extraction units since the war has made the industry highly efficient. All mills prepress in German or Polish screw presses and follow up on continuous-solvent extraction. One mill has a modern De Smet extractor. Another mill has American and West German equipment. Polish equipment is now being designed and used to upgrade the industry when new equipment is needed.

The Polish oilseed crushing industry and the fats and oils processing industry are operated under the direction of the Polish United Oil Industry (Zjedno-czenie Przemyslu Olejarskiego).

The crushing mills in Poland are located in Warsaw, Kruszwica, Brzegn/Odra, Bodaczew (Lublin Wojew), Trzebinia, and in country areas. All the mills have prepressing equipment that is used in processing rapeseed and other relatively high oil-content materials. As in the United States, soybeans are not prepressed.

A continuous-solvent extraction, prepress, oilseed-crushing unit was installed in 1962 at the oil mill in Kruszwica because it provided needed extra capacity for an expanding rapeseed area. This unit has a capacity of 300 tons per day. It is able to utilize excess steam from a sugar plant in the area. The plant has a De Smet continuous-solvent extractor and German screw presses. The mill is capable of crushing over 8,000 tons of oilseeds a month or 100,000 tons per year. The plant also has three modern "votators" that can produce 25,000 tons of margarine per year and is supported by a modern refinery equipped with continuous refinery equipment from the United States. The modern deodorizers likewise are from the United States. The plant also has modern hydrogenation and hydrogen-generating equipment.

This plant employs 600 people in direct production. Wages are the equivalent of around $50 per month, but often include housing. About 100 people are employed in distribution, and margarine is supplied direct to retail stores from the mill by 60 trucks.

The mill has 40,000 tons of storage for all oilseeds. Most of the rapeseed is received in railway cars in bulk, but some of it is bagged at the farm level and must be emptied into bulk conveying equipment.

Soybean, meal imports

Polish mills prefer to crush soybeans over domestic rapeseed, and if the price for soybeans is lower, as it may be in 1970, the Polish industry would try to acquire more soybeans for crushing. Soybeans can be crushed in all the large mills, as they have adequate preparation equipment; some have modern flaking equipment. However, according to Polish officials, there have been times when the Polish industry could obtain soybean oil and meal on world markets for less than the cost of purchasing and crushing soybeans. At these times, mills would crush only domestic rapeseed.

Government officials claim that oilseed and oilseed meal purchases are made on a price basis and that additional credit would not bring additional purchases from the United States. Furthermore, they claim that even in view of an estimated 50-percent decrease in rapeseed production in 1968-69, adequate supplies from previous years' stocks of rapeseed are on hand to provide needed vegetable oils for margarine. This indicates that unusually large additional soybean imports may not be needed in 1970.

Price is also reported to be the determining factor in making purchases of U.S. soybean oil—regardless of U.S. program availabilities—and of Soviet sunflower oil. Both these oils are used in margarine and give result about equal to those obtained from hydrogenated oils.

At present, Polish officials find it more to their advantage to purchase soybean and meal supplies through a New York bank. They have been compelled to open a letter of credit, which is costly as it requires that funds be tied up for 30 days before the meal or soybeans are received in Poland.

Officials of ROLIMPEX in Warsaw are responsible for the purchasing of soybeans and soybean meal, and contact with U.S. suppliers is made through their European offices and through a Polish officer stationed in New York.

The major complaint against U.S. soybeans concerns the increase in splits and broken beans. The Polish soybean crushing mills are located inland, and the extra transfer of beans probably causes this increase. U.S. No. 2 yellow soybean arriving at Polish crushing mills are often over 18 percent or higher in splits. The maximum allowable for No. 2 yellow soybeans is 20 percent.

U.S. soybeans are often received high in moisture—around 14 percent. These beans often have a low oil content not found in beans of lower moisture content.

The major shipping complaint against U.S. soybeans and meal involves loss of weight. Soybeans are usually purchased in lots of over 10,000 tons, and loss is sometimes over the ½-percent tolerance.

Demand for poultry meat

Demand for chicken (broilers) for domestic consumption (over 8.0 pounds per capita in 1968) has increased substantially. As a result, Poland does not now have sufficient supplies to export large quantities. Poland has had a good market for frozen broilers in Western Europe and has developed a reputation for quality. With the increase in domestic demand, exports of chicken have been reduced although ducks and geese are still being exported in large quantities.

Production of broiler meat has been increasing at a rate of 10,000 to 15,000 tons per year. The average broiler has a live weight of 1.41 kilograms (3.1 lb.) Total poultry meat production—broilers, ducks, and geese—was 140,000 tons in 1968 and an estimated 155,000 tons in 1969.

Imports of soybean meal or soybean equivalent can be expected to increase by about 10,000 tons annually to meet the expected increases in poultry production. Small farm use of mixed feeds in Poland will require almost three-fourths of a pound of soybean meal to produce 1 pound of poultry meat. An additional 3 pounds of soybean meal is needed for each layer.

Improved breeds and hybrid strains of chickens (broilers), particularly those supplied through an affiliate of a U.S. firm, have enabled the Polish producers to obtain improved efficiency in feeding with soybean meal. A 1.5-kilogram (3.3 lb.) broiler can be produced in 8 weeks with these improved strains, supposedly a cross between Cornish and White Rock.

Mixed feed industry

Poland has a modern 300-mill feed industry that produces around 3.5 million metric tons of mixed feed per year. Production of poultry feed amounts to approximately 460,000 to 500,000 tons. Over 220,000 tons are for the production of broilers. The industry consists of 30 large mills and 270 small ones, many of which are located on state or cooperative farms. All are part of the Polish Association of Feed Mills, which comes under the Ministry of Agriculture and Food. Many plants are equipped with British automatic equipment, and operations are controlled by formula cards. Feed ingredients, including soybean meal, vary according to the formulas provided through the Ministry by the Scientific Council of Poland and research consultants.

Soybean meal is considered an essential ingredient in this industry. Use of soybean meal ranges from 5 to 25 percent, depending upon the type of livestock feed. Broiler feeds, for example, take 20 to 25 percent. In the formulas for broiler chicks 12 to 15 percent soy meal is used, but for laying hens, 5 percent is used. Soybean meal is used in some feed formulas in combination with varying quantities of rapeseed and peanut meals. No fats are used in poultry feeds in Poland; however, the industry is planning on adding 3.5 percent in the future. Vitamins and minerals are imported in premixes.

Poland has no industrial egg production as in other East European countries; eggs are produced on small farms. Many broilers are also raised by small farmers although most are produced on the country's five kombins (large government farms). Two of these have capacities of 1 million broilers and the other three produce 300,000 to 400,000 each.

COUNTRY PROFILE: HUNGARY

Summary

The Hungarian Peoples Republic, a nation of over 10 million people, has a government similar to that of the USSR. This landlocked country is about the size of the State of Indiana and is primarily rural in nature. American corn is now a major crop, along with wheat, feed grains, sugar beets, potatoes, and sunflowers. The agriculture was organized into collectives during 1949-60, and collectives and cooperatives make up 78 percent of the country's agricultural land. The country also has large state farms. One such farm has 28,000 acres. Per capita income is higher than in Yugoslavia, but the national economy does not seem to be expanding with as much force.

Hungary can be expected to be a permanent market for U.S. soybeans and/or meal because soybean meal has come to be considered essential to the expanding poultry industry and soybeans cannot be grown economically because of the relatively hard growing season. Demand for soybean meal, the country's most important import commodity in 1967, can be expected to continue to expand in direct relation to the expansion of the poultry and hog industries. High inland transportation costs for soybeans and the availability of large quantities of sunflowerseeds for crushing for oil point to better chances for growth in imports of meal as opposed to beans. Demand for soybean meal should reach 60,000 metric tons next year and 100,000 tons in about 5 years.

Direct contact between the West European offices of U.S. soybean crushers and trading firms and the Hungarian buying monopoly, AGRIMPEX, have been most helpful in developing the Hungarian market for soybean meal and will probably be a major factor in its expansion. Hungarian officials have indicated their need for more credit on favorable terms, and some help along this line could probably increase imports.

Hungary's per capita consumption of fats and oils is currently around 25 kilograms (55 lb.) per year. However, this comprises 44 pounds of lard and hog fat and only 4.4 pounds of vegetable oils. Also, about 4.6 pounds of margarine are consumed and about 2 pounds of butter. The hog fat comes from the Yugoslavian-type fat hogs, 30 to 40 percent of whose weight is fat. For meat the country raises a Landrace hog that produces excellent ham.

Sunflowerseed production, crushing

Hungary's most important domestic oilseed is the sunflowerseed, accounting for 90 percent of the oilseeds produced. In the drought year of 1968 over 80,000 hectares or 197,680 acres of sunflowerseed were harvested. Plantings were up 10-15 percent in 1969, and the crop was excellent. Total production in 1968 was 89,300 metric tons, compared to a record 101,534 in 1966. A crop of over 100,000 tons was expected in 1969. In 1968 the yield was 12 quintals (1,200 kg. or 2,640 lb.) per hectare or about 1,069 pounds per acre, compared with 1,602 for soybeans in the United States. The country also harvested 12,000 hectares of flax and 13,000 hectares of rapeseed.

Eighty percent of the sunflowerseed grown is of the Soviet high-oil variety from Krosnodar (VNINK #6540). Yields of the Soviet sunflowers are about the same as the Hungarian, but the oil yields are higher. The Soviet seeds contain 46-50 percent oil, compared with 38-40 percent in the Hungarian varieties. By using the Soviet varieties, the oilseed crushing industry has increased average oil recovery in the last 10 years from 34.7 percent to 47.63 percent, dry weight basis.

Average yields per hectare have not improved much because farmers have tended to use their worst soils for sunflowers. The present trend is to plant Soviet varieties on better soils, sometimes land that has previously been planted to corn. Also, more fertilizer is being used. Average rates are 150 kilograms of nitrogen per hectare as a minimum. With this amount of fertilizer, oil yields have been very good.

The oilseed crushing industry in Hungary is capable of handling about 850 tons of oilseeds, in terms of sunflowerseed, per day. There are four large oilseed crushing plants and one plant producing corn oil. Two large plants are located in Budapest, with capacities of 250 and 200 tons; there is also a large mill in Gyor and another in eastern Hungary. The four large oilseed plants all prepress sunflowerseed, followed by solvent extraction. The smallest of the four mills uses batch-extraction equipment, while the others use continuous equipment. U.S. soybeans are crushed at Budapest from time to time, as also are Chinese soybeans. Since U.S. soybeans have produced about 2 percent more oil than Chinese, they are well liked. The industry also crushes some rapeseed. It operates at the rate of 300 tons of oil per day. Only 20 percent of the country's protein needs are produced.

The 250-pound capacity plant in Budapest was built in 1942 and subsequently modernized. The sunflowerseed crushed at the plant now averages about 45 percent oil. The seeds are finely milled and decorticated before screw pressing. There are six modern German presses and two older ones. About half the oil in the sunflowerseed is removed by prepressing in these screw presses. The extractor is an original Bollman basket type, five stories high. It is operated on a 10-percent half miscella and 15-percent full miscella (ratio oil-gas) basis for oil recovery. After refining in a modern De Laval continuous refinery, the oil is processed into margarine or bottled. The refinery has a capacity of 80 tons per day. It is being remodeled to step up capacity to 100-130 tons per day.

The oil is bottled in plastic containers by automatic Swiss equipment with a daily capacity of 40,000 plastic bottles (3.4 liters) and a second machine of German-Austrian design with a capacity of 24,000 1-liter containers.

Margarine is made with 45 percent sunflower oil, 35 percent fish oil, and 20 percent soybean, rape, and other oils and fats. Only 0.2 percent salt is used, and vitamin A and vitamin D are added. The margarine contains no milk but is colored yellow. Production here could reach 54 tons per day.

The director of this plant would like to build a plant to crush soybeans. The soybean oil and meal could be sold in all the Danube countries. He feels there is an opportunity for establishing this type of plant and expressed need for cooperation with an American firm. The plant would have an advantage in labor costs as wages are about 2,000 florins or $67 per month versus $500 in the United States.

Oilseed research

The Research Institute at Iregszemcse, Hungary, under the direction of Prof. E. Eurnik, has concentrated its work on sunflowerseed, soybeans, and rapeseed. Research covers all the diseases that affect sunflowers, and efforts are

being made to develop disease-resistant varieties. Research has turned to producing Hungarian seed high in oil content because Soviet types are not disease resistant. Goals are to produce seed with an oil content of 50 percent and to obtain disease resistance. Work is also going on to determine the most effective weed killers.

Disease research includes work on a fungus that destroys plants completely. Also, work is being done on root diseases. Other research includes work on diseases that affect the seed, oil content, and acid number as well as on leaf louse, rust disease, and orabache disease. In Autumn, when the rains come, this latter disease destroys 15-20 percent of the plants.

Soybean research has focused on obtaining the right weed killer for use under Hungarian conditions. Field plots have shown great variations in results. Spacing tests are also being concluded. The research station has 6,000 different plots of soybeans for variety testing and spacing. Many U.S. varieties are being tested, including Flambeau and Norchief from among the northern varieties; Lincoln, Harosoy, Hawkeye, and Clark from the central United States; and Jackson and Lee from southern areas. All show excellent plant growth but considerable variation in yields. U.S. varieties have a maturity period that is too long for Hungary, and yields generally have been extremely poor. Research is continuing although the Ministry of Agriculture and Food reported that very little headway has been made in the development of soybean varieties adaptable to Hungary. Sunflowers, though more adaptable, do not provide adequate protein to meet the country's needs. About 1,000 hectares (2,470 acres) of soybeans were planted in 1969.

Purchasing soybeans and meal

The sole purchasing agent for soybeans and soybean meal in Hungary is the government-owned company, AGRIMPEX, a trading company for agricultural products. Products traded, besides soybeans and meals, include grains, cereals, vegetable oils, fishmeal, meat meal, sugar, and seeds.

The import tariff on soybeans is now 10 percent and that on meal is now 40 percent. Hungary buys 10,000 to 20,000 tons of soybeans, depending upon industry requirements, and a total of around 50,000 to 60,000 tons of soybean meal each year. AGRIMPEX emphasizes the importance of its soybean meal imports, 20-25 percent of its total imports. Its officials greatly appreciate being able to buy in cargo lots. U.S. 44-percent meal is usually purchased. However, some 50-percent meal is purchased from time to time. One recent cargo purchase was made at 44 percent protein and 8.5-percent fiber. Price is a factor in buying meal and was a consideration in buying some high in fiber content.

U.S. soybean meal is imported in rail cars holding about 25,000 pounds each, direct from ports in Italy, Yugoslavia, and Poland (Trieste, Rijeka, and Gydnia). Much of the meal is shipped in bulk. The soybean meal is used mainly in mixed poultry and hog feeds.

Complaints about U.S. meal are very nominal, and the Hungarians are generally satisfied with its quality and the results of its use. Sometimes the meal received is lumpy. One tradesman commented that there was a loss in one cargo of more than 3 percent by weight.

The technical aid received from several large U.S. crushing firms, who have provided compound feed formulas and advice on factory production, has been very useful to Hungary. It is this kind of servicing that has helped establish a market for U.S. soybean meal in Hungary.

Hungary hopes to be able to export more agricultural products to the United States—hams and sausages, for example—as it continues to import U.S. soybeans and meal.

Mixed feed industry

The mixed feed industry comprises two systems: (1) large central mixing plants and (2) small mixing plants on cooperative farms. Over 1 million tons of commercial mixed feed are produced each year in 200 plants. The Ministry of Agriculture aims to consolidate many of the smaller inefficient mills into larger ones.

Of the mixed feed produced, 35 percent is used in the poultry industry and 50 percent is used in the hog industry. The balance is consumed in the cattle industry. Feed formulas nearly all contain soybean meal and are about the same as those used in the United States including about 5 percent fishmeal.

Hungary is importing over 100,000 tons of peanut meal from India annually; this is used extensively in cattle feeds and in some cases in other formulas to cover shortages of soybean meal. Fats have not been used extensively in Hungarian feeds, and further progress is needed. Premixes, including vitamins, minerals, and soybean meal, are purchased from a U.S. company and mixed by the feed mills. Formulas are prepared centrally, and technical advice on formulas has been received from several U.S. companies. The large mills (approximately 100) are located as close to farms as possible, and many are located on the larger state farms.

One large state farm—27,000 acres—southwest of Budapest utilizes the economies of large-scale production to raise livestock and poultry. The farm also produces wheat, corn, and sunflowerseed. It has its own mixed-feed plant capable of producing 30,000 to 40,000 tons per year. This plant uses large quantities of American soybean meal. A dryer for corn and a silo are being built, and processing capacity is being expanded.

Livestock and meat

Hungary had problems in 1969 in maintaining sufficient meat supplies for domestic consumption. The beef supply was sold off in the fall of 1968 and supplies of pork and veal were down in 1969. There was not enough feed following last year's drought to carry the herds, and hog numbers were down. Consumers were offered chicken in lieu of the other meats. Chicken was probably diverted to the domestic market from such export markets as Switzerland. Per capita consumption in 1969 was likely much higher than the estimated level of 25 pounds in 1968. When supplies of chicken are available, Hungary has a profitable export market, and is adding new markets in the Middle East and Japan to its list of older ones—like Switzerland and Austria—in Europe.

Some statistics on poultry and livestock production follow:

	1966	1967	1968	1969[1]
Poultry numbers (Jan. 1):				
Chickens				
Thousands	26,964	30,230	29,149	30,000
Total				
Thousands	28,589	32,184	31,093	32,000
Poultry meat production				
1,000 metric tons	150	164	166	175
Hog numbers (Jan. 1)				
Thousands	5,799	6,005	6,609	5,334
Cattle numbers (Jan. 1):				
Thousands	1,973	2,014	2,096	2,060

[1] Estimated.

Oilseeds imports

Oilseed	1963	1964	1965	1966	1967	1968
	Metric tons	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*
Peanuts:						
shelled	6,477	7,301	3,111	2,821	2,556	1,521
unshelled	895	846	552	798	1,477	541
Soybeans	16,330	15,768	30,229	23,448	36,410	3,797
From the United States	--	--	--	12,274	--	--
Sunflower seed	20	9	--	1	17,046	12,920
Flaxseed	11	61	60	150	185	38

Animal and Vegetable Fat and Oil Imports

Fats and Oil	1963	1964	1965	1966	1967	1968
	Metric tons	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*
Sunflower seed oil	4,615	2,711	5,513	15,988	17,103	22,103
Linseed oil	4,183	3,188	5,600	2,435	--	--
Lard	17,780	17,750	9,150	7,109	27,735	7,512
Tallow	4,642	3,809	5,404	5,387	4,245	2,490
Butter	2,949	913	5,715	4,534	5,427	2,460
Fish oil	2,670	2,438	2,583	2,995	3,445	4,044
Sperm oil	1,780	991	1,598	1,718	1,552	1,492

Oilseed and Vegetable Oil exports

Item	1963	1964	1965	1966	1967	1968
	Metric tons	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*
Sunflower seed	16,750	14,339	10,442	13,683	13,990	18,216
Sunflower oil	26,756	21,171	15,029	24,705	30,907	32,287

Imports of oilcakes and meals and Fish Meal Cy 1963-1968

Item	1963	1964	1965	1966	1967	1968
	Metric tons	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*	*Metric tons*
Oilcakes and meals	161,700	186,661	183,701	228,726	245,280	266,654
Soybean meal from U.S.	--	--	51,503	18,514	32,910	32,994
Fish meal	24,229	28,683	34,698	27,788	32,527	47,809

Fats and oils consumption per capita

Item	1966	1967[1]	1968[1]	1969[1]
	Pounds	*Pounds*	*Pounds*	*Pounds*
Vegetable oils	4.4	5.0	5.0	9.0
Slaughter fats	46.2	46.0	45.0	44.0
Butter	3.0	3.0	3.0	2.0
Total	53.6	54.0	53.0	55.0

[1] Estimated.

COUNTRY PROFILE: CZECHOSLOVAKIA

The market

Czechoslovakia is a small but growing market for U.S. soybean meal and soybeans. The present political problems are tending to depress this market, but a demand for quality soybeans and meal does exist and could be further developed in the future. Price is important in Czechoslovakia's purchases and often results in soybean meal being imported from West Germany, the major import area for U.S. meal. Currently, credit problems are blocking the Czechoslovakian market.

Czechoslovakia has four large integrated fats and oils plants, including the former large Unilever plant at Usti just north of Prague. There are two other smaller mills. The industry can crush around 250,000 tons of oilseeds per year. Rapeseed and sunflowerseed are the two major oilseeds crushed. A small soybean flour plant has been constructed near Prague.

Rapeseed is the major domestic oilseed crop. Production was 82,000 tons in 1968, compared with 85,000 in 1967, 78,000 in 1966, and 74,000 in 1965.

Imports

The Czechoslovakian Government monopoly KOOSPOL has the responsibility for importing soybeans and soybean meal, as well as grains and other agricultural products. Officials of this statetrading organization stress two points in their buying operations that are of concern to the United States: credit and price. They also point out that Czechoslovakia would like to export more of its products to the United States as it imports such U.S. products as soybeans and soybean meal. They often purchase soybean meal from West Germany as Czechoslovakia has sufficient trade with that country to establish credit there. There appears to be a need for similar credit in purchasing U.S. soybeans and soybean meal. However, national plans and goals could curb the use of available credit.

KOOSPOL officials are in daily contact with suppliers, particularly with those U.S. and international grain firms that have offices in Europe. They are also in contact with the Peruvian fishmeal organization in Switzerland and buy fishmeal from other countries like Iceland and Norway, too.

KOOSPOL purchased 12,500 metric tons of soybean meal from the United States in 1968, compared with 8,937 tons in 1967, 15,411 in 1966, and only 965 in 1965. Earlier purchases of meal averaged less than 500 tons, as have shipments of U.S. soybeans direct to Czechoslovakia.

Large quantities of peanut and cottonseed meals are now being imported from India and are being substituted in feed formulas where possible. Peanut meal imports were 105,924 tons in 1968, fifty percent more than in 1967. Imports of cottonseed meal were 28,952 tons, compared with 40,581. Czechoslovakia also imports around 40,000 to 50,000 tons of vegetable oils each year.

Feed and livestock

The feed-mixing industry mixes an estimated 2.5 million tons of feed per year and uses as much soybean meal as it purchases. It could use more if the meal were available. Soybean meal is brought in through the port of Hamburg, where it is transferred to barges, brought up the Elbe River, transferred to rail wagons, and shipped to feed mills.

Czechoslovakia has about 300 small feed mills, many supplying local farms. Some consolidation is taking place, and many plants are being closed because of their lack of efficiency. It is expected that the country will have about 160 mills operating following consolidation.

Production of broilers is being stepped up and has increased nearly 50 percent since 1965. More soybean meal is expected to be used in broiler rations in the future. Present use varies considerably according to availability.

Some statistics on livestock production follow:

	1965	1966	1967	1968	1969[1]
Poultry numbers (Jan. 1) *Thousands*	–	27,753	29,466	31,208	32,000
Poultry meat production *1,000 metric tons*	53	58	68	81	90
Hog numbers (Jan. 1) *Thousands*	5,915	5,544	5,305	5,582	5,300

[1] Estimated.

COUNTRY PROFILE: BULGARIA

Summary

Bulgaria is a growing market for U.S. soybean meal, and annual imports are expected to increase 50 percent to 60,000 tons or more in the next few years. The quasi-government state trading agency that buys U.S. soybean meal maintains direct contact with U.S. industry representatives in Western Europe, and the excellent service the agency has received has helped establish this market. Bulgaria has a need for more credit to continue and expand its soybean meal imports from the United States.

Bulgaria's sunflowerseed production has been expanding, and the (1969) last year's crop was a near record. However, sunflowerseed meal is not so efficient as soybean meal in poultry and hog feeds. Soybean trials in Bulgaria have not been successful.

Great strides are being made in poultry production, and output of poultry meat production is planned to reach 100,000 tons in the next few years. This optimistic goal may be accomplished through use of U.S. breeds and hybrid strains and improved feeding methods using soybean meal.

Domestic oilseeds

Bulgaria produced a reported record 516,000 metric tons of sunflowerseed in 1969, up from the previous year's 456,000 and greater than the 478,000 produced in 1967. Sunflowers are reportedly a soil-exhausting crop and require considerable nitrogen. Oil content of the seed now averages 48 to 50 percent as a result of introduction of new USSR varieties and research. Previously, it was only 30 percent. Researchers also have developed disease-resistant varieties. Bulgaria plans to grow sunflowers on the same soil as wheat since sunflowers are harvested in late August, a month before the wheat is planted.

Over 287,000 hectares (708,890 acres) were planted to sunflowers in 1969; this is near the country's maximum. Average fertilizer use is 120 kilograms (264 lb.) of nitrogen, 120 of phosphorus, and 80 (176 lb.) of potassium per hectare.

Crushing industry

Bulgaria has two prepress solvent-extraction crushing mills that are large and modern, as well as 20 small plants with a variety of equipment. Estimated annual capacity is around 400,000 to 450,000 metric tons. Estimated capacity of the large mills is 500 tons per day and the small mills 1,000 tons for a total daily capacity of 1,500 tons. A large mill is now being built that will have continuous-solvent equipment of the De Smet type to complete its solvent operations on sunflowerseed.

Per capita consumption of fats and oils (animal and vegetable) in Bulgaria was 34 pounds in 1969 and has held fairly steady for the last 5 years.

Purchasing

Bulgaria imported about 29,698 tons of U.S. soybean meal in 1969. This compares with 25,767 in 1968, 31,892 in 1967, and 14,128 in 1966. The companies in charge of imports are HRANEXPORT and RODOPA, which are combining operations into the one company–HRANEXPORT. This buying organization is in almost daily contact with the market and has direct contact with the European offices of U.S. firms. The director believes that U.S. meal is superior in quality to Chinese and Brazilian meals and intends to continue to purchase the U.S. product unless he can obtain lower priced meals that will give the same results. There is a need for more credit in purchasing soybean meal from the United States.

The quality of the soybean meal imported is generally near 44 percent protein. No 50-percent soybean meal has been purchased. The soybean meal is imported in cargo lots through the port of Varna.

Mixed feeds and livestock

Bulgaria's feed-mixing industry comprises 30 plants producing over 1 million tons of mixed feeds and concentrates. Over 40 percent of the feed is for poultry, and the balance is mainly for hogs. The country is now operating 18 of these plants full time. Fats have not been used in feeds.

In broiler feeds, up to 25 percent soybean meal is used. Layer feeds take 18 to 20 percent. Some sunflowerseed meal is used in poultry feeds, but the amount is limited. Results with soybean meal feeds have been outstanding. On

state farms, the Bulgarians have achieved feed-conversion ratios of 2.1-2.4 to 1 using feeds high in soybean meal. Attempts have been made to substitute wheat in poultry feeds, but apparently without too much success.

Bulgaria has been making great strides in poultry production and hopes to boost its output to 100,000 tons by 1975 from the 1969 level of 75,000 tons. To achieve this goal, imports of soybean meal would have to be increased from about 30,000 tons to 60,000 tons or more. The poultry breeds and hybrid strains that best utilize soybean meal were originally imported from the United States.

Bulgaria exports some frozen broilers in large containers. Domestic consumption was estimated at about 8.0 pounds per capita in 1967.

Some statistics on livestock and poultry follow:

	1966	1967	1968	1969
Poultry numbers (Jan. 1)				
Thousands	20,845	23,637	27,726	[1] 30,000
Poultry meat production				
Metric tons	48,000	60,000	64,000	[1] 75,000
Hog numbers (Jan. 1)				
Thousands	2,408	2,276	2,314	[1] 2,356

[1] Reported.

APPENDIX

Table 1.–United States: Soybeans, soybean oil, and soybean meal; exports to Eastern Europe[1] by country of destination

Country & item	Unit	Average 1960-64	1965	1966	1967	1968	1969
Bulgaria:							
Soybeans	1,000 bu.	0	0	0	0	0	0
Soybean oil	1,000 lb.	0	0	0	0	0	0
Soybean meal	Metric tons	2,132	17,429	14,128	31,892	25,767	29,698
Czechoslovakia:							
Soybeans	1,000 bu.	492	1,227	690	552	129	403
Soybean oil	1,000 lb.	1,540	0	0	0	0	0
Soybean meal	Metric tons	408	965	15,411	8,937	12,500	0
Hungary:							
Soybeans	1,000 bu.	239	1,324	451	0	0	0
Soybean oil	1,000 lb.	0	0	0	0	0	0
Soybean meal	Metric tons	9,907	31,503	18,514	32,910	32,994	39,493
Poland:							
Soybeans	1,000 bu.	586	953	19	1,714	2,077	3,084
Soybean oil	1,000 lb.	47,298	13,566	11,630	13,040	13,260	5,067
Soybean meal	Metric tons	2,580	30,276	36,477	50,540	91,329	87,803
Yugoslavia:							
Soybeans	1,000 bu	[2]	0	0	362	0	0
Soybean oil	1,000 lb.	74,550	79,666	35,194	90,032	6	7
Soybean meal	Metric tons	35,723	70,288	72,503	144,128	106,520	135,010
Total:							
Soybeans	1,000 bu.	1,317	3,504	1,160	2,628	2,206	[3] 3,682
Soybean oil	1,000 lb.	123,388	93,232	46,824	103,072	13,266	5,074
Soybean meal	Metric tons	50,750	150,461	157,033	268,407	269,110	[3] 302,004
Total shipments, beans and meal as soybean meal	Metric tons	78,913	[1] 225,389	181,838	324,603	316,283	380,735

[1] An additional 2,230,000 bushels of soybeans were shipped to the USSR in 1965. [2] Less than 520 bu. [3] East Germany took 195,000 bushels of soybeans, and Romania took its first large shipment of 10,000 tons of soybean meal direct from the United States in 1969.

Compiled from official reports.

Table 2.—EASTERN EUROPE: Soybean meal imports by country

Country	Average 1960-64	1962	1963	1964	1965	1966	1967	1968[1]
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*
Bulgaria	1	---	--	14	9	18	[2] 32	[2] 25
Czechoslovakia	3	1	--	16	9	23	[2] 9	[2] 25
East Germany[3]	18	--	16	72	151	277	[2] 220	[2] 223
Hungary	14	13	21	36	32	18	[2] 34	[2] 33
Poland[2]	5	--	3	4	31	36	51	97
Romania[2]	--	--	--	--	6	28	35	53
Yugoslavia	36	20	47	103	79	62	142	[4] 34
Total	77	34	87	245	317	462	523	490

[1] Preliminary. [2] Estimates based on trade reports. [3] Estimates based on West German trade statistics. [4] U.S. shipments 107,000 metric tons.

Table 3.–EASTERN EUROPE: Protein meal imports and estimated available supplies[1]

Country and item	1967	1968	1969[2]
Bulgaria:			
Imports:	*Metric tons*	*Metric tons*	
Soybean meal	31,892	25,767	29,698
Peanut meal	10,916	--	NA
Fishmeal	6,164	8,925	NA
Other	--	--	NA
Domestic production:			
Sunflowerseed, meal equivalent	173,200	183,200	NA
Cottonseed and other, meal equivalent	20,000	13,000	NA
Total meal availability	242,172	230,892	--
Czechoslovakia:			
Imports:			
Soybean meal[2]	20,741	15,258	8,256
Peanut meal	70,277	105,924	NA
Cottonseed meal	40,581	28,952	NA
Fishmeal	49,362	43,680	NA
Other	--	--	NA
Domestic production:			
Rapeseed, meal equavalent	51,000	49,200	NA
Flaxseed and other, meal equivalent	8,300	7,300	NA
Total meal availability	240,261	250,314	--
East Germany:			
Imports:			
Soybean meal	252,000	259,000	350,000
Peanut meal	95,311	91,559	60,000
Sunflowerseed	35,000	35,000	40,000
Fishmeal	66,789	81,005	90,000
Other	17,000	23,125	48,000
Domestic production:			
Rapeseed, meal equivalent	103,560	113,200	100,000
Flaxseed and other, meal equivalent	17,000	15,000	15,000
Total meal availability	586,660	617,889	695,000
Hungary:			
Imports:			
Soybean meal[3]	61,310	35,994	39,493
Peanut meal	72,634	101,750	NA
Fishmeal	32,527	47,809	NA
Other	111,356	128,910	NA
Domestic production:			
Sunflowerseed, meal equivalent[4]	37,222	33,823	NA
Flaxseed and other, meal equivalent	9,817	10,000	NA
Total meal availability	324,866	358,285	--
Poland:			
Imports:			
Soybean meal[3]	87,191	135,743	154,640
Peanut meal	105,295	161,117	130,000
Cottonseed cake and meal	12,945	21,212	25,000
Fishmeal	41,861	68,866	110,000
Other	5,393	20,883	45,000
Domestic production:			
Rapeseed, meal equivalent[4]	290,600	360,000	220,000
Flaxseed and other, meal equivalent	50,720	48,635	45,000
Fishmeal production	21,500	21,950	30,000
Total meal availability	615,505	778,406	759,640

See footnotes at end of table.

Table 3.–EASTERN EUROPE: Protein meal imports and estimated available supplies–Cont.

Country and item	1967	1968	1969[2]
Romania:			
Imports:	*Metric tons*	*Metric tons*	
Soybean meal	39,000	58,000	10,000
Peanut meal	--	--	NA
Fishmeal	800	760	NA
Other	--	--	NA
Domestic production:			
Sunflowerseed, meal equivalent	291,960	293,600	NA
Flaxseed, soybean and other oilseeds, meal equiv	32,237	30,208	NA
Total meal availability	363,997	382,568	--
Yugoslavia:			
Imports:			
Soybean meal[2]	151,869	106,521	135,010
Peanut meal	11,555	39,386	NA
Fishmeal	67,316	52,965	NA
Other	--	10,000	NA
Domestic production:			
Sunflowerseed, meal equivalent[2]	62,735	199,291	NA
Soybean and cottonseed meal[3]	7,111	9,403	NA
Total	300,586	327,566	--
Total:			
Imports:			
Soybean meal	644,000	636,283	--
Peanut meal	365,988	499,736	--
Cottonseed meal	53,526	50,164	--
Fishmeal	264,819	304,010	--
Other	168,749	217,918	---
Total domestic production, meal equivalent	1,176,962	1,237,809	--
Total apparent availability	2,674,047	2,945,920	--

[1] Shipments in lieu of import data.
[2] Based on trade sources and shipments.
[3] Includes meal of soybeans.
[4] Adjusted for imports and exports.

Table 4.–EASTERN EUROPE: Acreage and production of sunflowerseed, rapeseed, and flaxseed

Item and year	Bulgaria		Czechoslovakia		Hungary		Romania	
	Acreage	Production	Acreage	Production	Acreage	Production	Acreage	Production
Sunflowerseed:	*Acres*	*Metric tons*	*Acres*	*Metric tons*	*Acres*	*Metric tons*	*Acres*	*Metric tons*
1960	582,598	343,641	12,350	6,000	171,600	67,700	1,330,386	521,700
1961	570,600	301,400	4,940	2,000	316,964	105,400	1,215,238	481,400
1962	671,554	356,895	7,410	4,000	305,588	131,300	1,056,352	449,500
1963	627,634	336,000	12,350	5,000	297,827	126,176	1,147,038	505,900
1964	585,627	337,000	7,410	3,000	266,312	113,721	1,154,945	518,100
1965	659,757	357,000	4,940	2,000	235,256	75,398	1,141,602	564,000
1966	628,870	423,000	4,940	2,000	233,354	101,534	1,155,687	671,200
1967	661,487	478,000	4,940	2,000	203,991	79,120	1,187,563	719,800
1968	691,880	456,000	4,940	2,000	197,680	89,300	1,285,908	729,900
1969[1]	708,890	516,000	4,940	2,000	217,680	100,000	1,186,080	734,000
Rapeseed:								
1962-66 avg.	--	--	--	55,400	--	--	--	--
1963	--	--	--	41,000	--	--	--	--
1964	--	--	--	46,000	--	--	--	--
1965	--	--	--	74,000	--	--	--	--
1966	--	--	--	78,000	--	--	--	--
1967	--	--	--	85,000	--	--	--	--
1968	--	--	--	172,900	--	--	--	--
1969	--	--	--	[1] 80,000	--	--	--	--
Flaxseed:								
1960-64 avg.	--	--	125,000	15,012	17,000	4,471	84,000	15,190
1966	--	--	82,000	9,017	25,000	8,992	134,000	37,594
1967	--	--	--	--	28,000	13,996	135,000	36,759
1968[1]	--	--	--	--	25,000	--	135,000	34,038

Item and year	Yugoslavia		Poland		East Germany		Other	
	Acreage	Production	Acreage	Production	Acreage	Production	Acreage	Production
Sunflowerseed:								
1960	182,113	98,300	--	--	--	--	--	--
1961	212,012	117,000	--	--	--	--	--	--
1962	240,615	161,000	---	--	--	--	--	--
1963	345,940	231,000	--	—	--	--	--	--
1964	360,766	260,000	--	--	--	--	--	--
1965	392,889	265,000	--	--	--	--	--	--
1966	380,534	282,000	--	--	--	--	--	--
1967	363,237	253,000	--	--	--	--	--	--
1968	397,831	309,000	--	--		--	--	--
1969[1]	541,149	390,000	--	--	--	--	--	--
Rapeseed:								
1962-66 avg.	--	--	--	361,400	--	176,000	--	33,000
1963	--	--	--	227,000	--	128,000	--	33,000
1964	--	--	--	267,000	--	173,000	--	39,000
1965	--	--	--	504,000	--	211,000	--	38,000
1966	--	--	--	448,000	--	207,000	--	39,000
1967	--	--	--	651,000	--	272,600	--	40,000
1968	--	--	--	712,000	--	264,827	--	40,000
1969[1]	--	--	--	[1] 205,000	--	[1] 191,370	--	[1] 30,000
Flaxseed:								
1960-64 avg.	--	--	286,000	59,642	54,000	7,671	--	406
1966	--	--	261,000	71,987	40,000	6,427	--	254
1967	--	--	303,000	73,003	37,000	6,782	--	250
1968[1]	--	--	297,000	70,006	--	--	--	250

[1] Preliminary.

Table 5.—EASTERN EUROPE: Numbers of hogs, cattle, and poultry[1]

Country and item	Average 1961-65	1967	1968	1969[2]
Bulgaria:	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Hogs	2,331	2,276	2,314	[2] 2,356
Cattle	1,687	1,492	1,462	[2] 1,375
Poultry	22,000	23,637	27,726	30,000
Czechoslovakia:				
Hogs	5,948	5,305	5,582	[2] 5,300
Cattle	4,466	4,462	4,437	4,325
Poultry	--	29,466	31,208	32,000
East Germany:[3]				
Hogs	8,654	9,312	9,254	[2] 9,500
Cattle	4,605	4,918	5,019	[2] 5,110
Poultry	--	37,070	37,976	38,802
Hungary:[4]				
Hogs	6,216	6,005	6,609	5,334
Cattle	1,941	2,015	2,095	2,060
Poultry	---	32,184	31,093	28,120
Poland:[5]				
Hogs	13,080	14,233	13,911	[2] 14,400
Cattle	9,697	10,768	10,940	[2] 1,000
Poultry	--	81,026	81,000	84,300
Romania:				
Hogs	4,835	5,400	5,752	5,831
Cattle	4,639	5,198	5,332	5,130
Poultry	--	43,966	47,147	47,618
Yugoslavia:				
Hogs	5,815	5,525	5,865	5,093
Cattle	5,509	5,773	5,737	5,305
Poultry	---	35,153	35,974	37,142
Total Eastern Europe:				
Hogs	47,000	48,200	49,400	48,184
Cattle	33,000	35,000	35,400	34,700
Poultry	--	--	291,642	297,982

[1] January, unless otherwise specified. [2] Preliminary. [3] As of December. [4] As of March. [5] As of June 30.

Table 6.—EASTERN EUROPE: Production of poultry meat

Country	1964	1965	1966	1967	1968	Increase 1964-68
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*Percent*
Bulgaria	40	44	48	60	64	60
Czechoslovakia	55	53	58	68	81	47
East Germany	64	64	65	69	76	19
Hungary	143	144	150	164	166	16
Poland	82	89	104	107	[2] 115	40
Romania	81	85	93	97	100	23
Yugoslavia	73	80	88	95	95	30
Total	538	559	606	660	697	30

[1] Includes chickens, ducks, geese, and other poultry.
[2] Adjusted.

Table 7.—EASTERN EUROPE: Per capita consumption of fats and oils

Country	Vegetable oils	Slaughter fats	Butter (as fat)	Total
Bulgaria:	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1960	([1])	([1])	([1])	31
1966	([1])	([1])	([1])	34
Czechoslovakia:				
1960	42	17	11	70
1966	45	17	12	74
East Germany:				
1960	27	16	24	67
1966	31	16	23	70
Hungary:				
1960	3	46	2	51
1966	4	46	3	53
Poland:				
1960	8	16	8	32
1966	13	15	9	36
Yugoslavia:				
1960	7	16	1	24
1966	15	16	2	33

[1] No breakdown available; included in total.

Table 8.–EASTERN EUROPE: Production of butter, margarine, and compound fats

Country	Butter					Margarine and compound fats				
	1964	1965	1966	1967	1968	1964	1965	1966	1967	1968
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*
East Germany	173.0	198.7	206.5	209.2	221.8	195.2	203.1	199.3	190.6	193.0
Poland	87.0	104.8	117.8	119.7	123.8	146.8	139.0	135.0	136.0	139.0
Romania	19.0	21.8	28.2	30.1	27.0	--	--	--	--	--
Czechoslovakia	81.5	83.6	84.2	82.2	87.3	43.2	40.2	43.6	45.0	49.0
Hungary	19.0	17.0	19.3	23.3	21.5	--	--	--	--	--
Other Eastern Europe	26.2	28.1	29.0	30.1	30.6	31.8	33.7	35.1	34.4	35.5
USSR	846.0	1,072.0	1,042.0	1,061.0	1,080.0	606.0	670.0	599.0	624.0	650.0
Total	1,252.0	1,526.0	1,527.0	1,555.0	1,592.0	1,023.0	1,086.0	1,012.0	1,030.0	1,066.0

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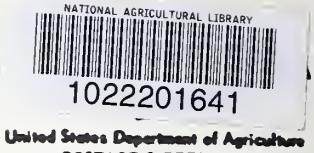

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